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In the Drawings

Please amend FIG. 1 of the drawings as shown in the replacement sheets of the drawings enclosed hereto, in which reference number "100" is added to designate the Control Unit as shown.

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Remarks

By the foregoing Amendment, claim 6 is cancelled without prejudice, and claims 1, 7, 9, 10, and 13 are amended. Claims 1-4, 7-15, and 36-40 are now pending in this application. No new matter is added by the amendments and supports thereof can be found from throughout the drawings, claims, and specification as originally filed.

Applicant respectfully asks the Examiner to reconsider the application and the Final Office Action in view of the foregoing amendments and the following remarks.

FIG. 1 of the drawings is objected to because of certain informalities therein. By the foregoing amendments, referenced number "100" is assigned to the "Control Unit" as shown in FIG. 1. It is clear that reference "22" designates a camera, and reference "100" designates a control unit which is coupled to the camera as shown and described in the specification. Accordingly, such informalities in FIG. 1 have been corrected.

Claims 1-15 and 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hattori (US Patent No. 6,212,751) in view of Asar (US Patent No. 6,434,264). Applicants respectfully traverse and submit that all of the claims currently pending (i.e., claims 1-4, 7-15, and 36-40) are patentably distinct over the references of record.

By the foregoing amendments, while canceling claim 6, all of the limitations in claim 6 have been introduced into independent claim 1. Independent claim 1 as amended requires, among other elements, (i) that a control unit have a display unit connected for displaying the surface images of the circuit board taken by the camera, in which the surface images include a first image representative of a portion of the surface of the circuit board and a second image representative of substantially the entire surface of the circuit board, (ii) that the control unit include a user interface for allowing a user to allocate a plurality of support locations for supporting the circuit board with the

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back-up pins at locations not interfering with parts disposed on the circuit board while viewing the first image and the second image of the circuit board displayed on the display unit; and (iii) that a transfer member be coupled with the control unit for transferring a plurality of back-up pins from the back-up pin stand to the allocated support locations on the back-up pin plate.

Hattori (US Patent No. 6,212,751) discloses an apparatus for examining a position, and subsequent correcting the position, of at least one board-support pin which was already positioned on a board-supporting base. As clearly stated in the Abstract and specification (see column 1, lines 48-51 and lines 25-44, and column 2, lines 1-23), Hattori is specifically concerned for examining and correcting the position of board-support pins (112) by a pin-position correcting device when the position of the pin already positioned on a board-support base (110) is determined to be inappropriate based on a judgment made after positioning the pins on the support base.

As detailed below, Applicants respectfully submit that Hattori fails to disclose or teach, among other limitations, at least the above-identified elements (i), (ii) and (iii) of the invention as claimed.

As discussed above, because Hattori concerns only for examining and correcting the position of board-support pins (112) after the pins are positioned on the support base, Hattori fails to suggest any of novel features of the invention as recited in the above elements (ii) and (iii). There is not any suggestion in Hattori that its control unit includes a user interface, which allows a user to allocate (before positioning the pins) a plurality of support locations for supporting the circuit board with the back-up pins at locations not interfering with parts disposed on the circuit board while viewing the first image and the second image of the circuit board displayed on the display unit. Moreover, there is not any suggestion in Hattori that its transfer member be coupled

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with the control unit for transferring a plurality of back-up pins from the back-up pin stand to the allocated support locations on the back-up pin plate.

Furthermore, as acknowledged by the examiner, Hattori does not disclose or provide any suggestion that its display device (186) can display the surface images of circuit board 24 in which the surface images include at least one image representative of a portion of the surface of the circuit board 24 and another image representative of substantially the entire surface of the circuit board 24. Accordingly, Hattori further fails to disclose or teach the above-identified element (i) of the invention as claimed. Hattori teaches the use of a CCD camera 56, which takes only the image of the board-support pins 112 and reference board marks provided on the printed-circuit board so as to detect a position of the circuit board for subsequent judgment and correcting the position of the board-support pins. However, contrary to the invention as claimed, the CCD camera 56 is not for taking any component images on the surface of the circuit board such as the first image representative of a portion of the surface of the circuit board and a second image representative of substantially the entire surface of the circuit board for the purposes of allocating adequate support locations thereof so as not to interfere with parts on the surface of the circuit board.

In clear contrast with Hattori, the present invention as claimed requires the novel features of allocating plural support locations of the back-up pins at locations not interfering with parts disposed on the circuit board while viewing at least the first image and the second, and of subsequent transferring a plurality of back-up pins from the back-up pin stand to the allocated support locations on the back-up pin plate, while utilizing the surface images taken by a camera, which includes a first image representative of a portion of the surface of the circuit board and a second image representative of substantially the entire surface of the circuit board, as respectively required by the above elements (ii), (iii), and (i).

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In summary, Hattori does not disclose or teach any of these elements (i), (ii), and (iii) of the invention as claimed in claims 1-4, 7-15, and 36-40. Furthermore, as discussed, Hattori is concerned to solve a different problem of examining and correcting, but not allocating before actual positioning of pins, the locations of the pins after the pins are positioned.

Asar (US Patent No. 6,434,264) discloses a vision comparision inspection system for inspecting or identifying defects in a printed circuit assembly line. However, Asar is cited by the Examiner only to suggest if it discloses a display unit that displays a first image representative of a portion of the surface of the circuit board and a second image representative of substantially the entire surface of the circuit board as recited in the above element (i).

Applicant respectfully submit that, as Hattori discussed above, Asar also fails to disclose or teach, among other limitations, at least the above elements (ii) and (iii) of the invention as claimed. Asar is absolute silent as to, as required by the above elements (ii) and (iii) of the invention, if any device of the system is to be used to allocate plural support locations of the back-up pins at locations not interfering with parts disposed on the circuit board while viewing at least the first image and the second, and as to if it include any transfer member for transferring a plurality of back-up pins from the back-up pin stand to the allocated support locations on the back-up pin plate.

Moreover, Asar is not related to an apparatus for positioning back-up pins on a support plate for supporting a circuit board thereon while utilizing the surface images of the circuit board, including a first image representative of a portion of the surface of the circuit board and a second image representative of substantially the entire surface of the circuit board.

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In summary, neither Hattori nor Asar discloses any of the above-identified elements (ii) and (iii) of the invention as claimed. Accordingly, claims 1-4, 7-15, and 36-40 are patentable over these references.

Moreover, as discussed above, Hattori is concerned to solve a different problem of examining and correcting the locations of the pins after the pins are positioned, but not of allocating the pin positions before actual positioning of pins as required the invention. Similarly, Asar is concerned to solve a different problem of inspecting any defects in the circuit board, but not of allocating the pin positions before actual positioning of pins as required the invention. Therefore, it is clear that one of ordinary skill in the art would not find any motivation to combine or modify the teachings of Hattori and Asar to arrive at the invention as claimed.

For the foregoing reasons, Applicants submit that all pending claims, namely claims 1-4, 7-15, and 36-40, are patentable over the references of record and in condition for allowance. Favorable reconsideration of the final Office Action is earnestly solicited.

Respectfully submitted,

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